STATE OF MICHIGAN

JOHN ENGLER, Governor
DEPARTMENT OF ENVIRONMENTAL QUALITY
HOLLISTER BUILDING, PO BOX 30473, LANSING MI 48909-7973
RUSSELL J. HARDING, Director

REPLY TO:

ENVIRONMENTAL RESPONSE DIVISION
KNAPPS CENTRE
PO BOX 30426
LANSING MI 48909-7926

June 11, 1996

Michael S. Maierle, P.E., Senior Engineer
Geraghty & Miller, Inc.
126 N. Jefferson Street, Suite 400
Milwaukee, Wisconsin 53202

Dear Mr. Maierle:

Please find enclosed a copy of the comments from Mr. Robert Delaney, Geological Support Services Section, Environmental Response Division, on the following North Bronson Industrial Superfund site Potentially Responsible Party documents.

1. Description and Evaluation of Alternative Groundwater Remedies,
2. Recommended Revised Remedial Action Objectives Based on the Part 201 Amendments, and
3. Assessment of Potential Surface Water Impacts Associated with Vented Groundwater.

His comments are for your information. A formal response is not required. We would however, like to discuss these comments and your proposals during our next conference call scheduled for Tuesday, July 2, 1996, at ten-o-clock am. If you have any questions, please call me.

Sincerely,

William Harmon, Project Manager
Superfund Section
Environmental Response Division
517-373-4951

Enclosures

cc: Rosita Clarke-Moreno, EPA
Dr. George Carpenter, MDEQ (w/o enclosures)
Mr. Jim Heinzman, MDEQ (w/o enclosures)
Mr. Robert Delaney, MDEQ (w/o enclosures)

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

April 18, 1996

TO: Bill Harmon, Project Manager
Site Management Unit 1
Superfund Section
Environmental Response Division

FROM: Robert Delaney, Geologist
Superfund Support Unit
Geological Services Section
Environmental Services Division

SUBJECT: PRP Description and Evaluation of Alternate Groundwater Remedies; Recommended Revised Remedial Action Objectives Based on the Part 201 Amendments and the Assessment of Potential Surface Water Impacts Associated with Vented Groundwater, North Bronson Industrial Area Superfund Site, Branch County

I have reviewed the PRP's recommended changes for the North Bronson Superfund Site Remedial Investigation and Feasibility report. I have the following comments:

RECOMMENDED REVISED REMEDIAL ACTION OBJECTIVES BASED ON THE PART 201 AMENDMENTS, SUPPLEMENT TO THE FEASIBILITY STUDY

(1) **Section A. Lagoon Area Soils and Sediments, Recommended Revised RAOs for Lagoon Soils/Sediments, second bullet**

The PRP proposes that the RAO for soils and sediments cleanup be based upon protection of groundwater or groundwater/surface water interface. This is appropriate. However, it is proposed that the soil remediation be limited to above the water table. This is not appropriate. Disposal techniques often contaminate aquifer materials to the point where they become a source of continuing contamination. This is especially true for a site such as the lagoons because they were excavated to below the water table. Most impacted soils and sediments will be below the water table. The critical technical question is whether these soils and sediments will be a continuing source of contamination for groundwater and surface water contamination. And secondly, what is the technically practical and legally acceptable method of dealing with the soils and sediments.

(2) **Section D. County Drain #30 Sediments, Default County Drain #30 Sediment Cleanup Criteria Based on ARARs, first bullet**

The county drain is not an industrial site and therefore Generic industrial direct contact criteria are not appropriate.

DESCRIPTION AND EVALUATION OF ALTERNATE GROUNDWATER REMEDIES, SUPPLEMENT TO THE FEASIBILITY STUDY

(3) **Section I. Screening of Alternate Groundwater Technologies, A. In-situ Vegetative Remediation, page 2, first paragraph**

Because this proposal for In-situ Vegetative Remediation is innovative, references and technical materials need to be provided to this office. It would appear that such a proposal would be inappropriate for the groundwater of the lagoons because the distance from the lagoon to the surface water is so short that, unremediated groundwater would have sufficient time to move to the drain from under the lagoons, during the winter, while the vegetation was inactive. The velocity of contaminant movement will need to be calculated.

Another question is how long would it take to establish sufficiently mature vegetative cover to control groundwater under the lagoons.

(4) **Section II. Detailed Analysis of Alternate Groundwater Remedies, A. In-situ Vegetative Remediation Alternative**

Item 1. Description of In-Situ Vegetative Remediation Alternative, page 6, first full paragraph

Under the in-situ vegetative remedial alternative, regrading of the surface soils is proposed. Would this effect the proposal to cap the wastes or otherwise isolate these wastes?

(5) **Implementability, page 7**

Under the in-situ vegetative remedial alternate, how would soils and sediments that exceed site specific risk contaminant levels be dealt with?

Section B. In-situ Metals Precipitation Remediation Alternative

(6) **Item 1. Description of In-Situ Metals Precipitation Remediation Alternative, page 8**

The proposal for in-situ precipitation of metal appears to be a reaction wall placed near the county drain in the area of the lagoons. This may be effective for treatment of metals contaminated groundwater. However, as the consultant pointed out, it would not be effective for treatment of organic contaminated groundwater. Has a reaction wall for organics been considered. Would it be possible to place both a reaction wall for metals and one for organics in series to address both groundwater problems?

ASSESSMENT OF POTENTIAL SURFACE WATER IMPACTS ASSOCIATED WITH VENTED GROUNDWATER

The department is in the process of preparing a guidance document regarding mixing zones and groundwater/surface water interface (GSI). Thus, it is not possible to provide precise guidance on how such calculations will be done in the future. However, the following comments on the PRPs analysis will help identify issues that likely need to be addressed for this site.

Characterization of Vented Groundwater, page 4

(7) The consultant points out that groundwater monitoring data may not accurately reflect the contaminant levels at the GSI. The consultant used numerous wells in their calculation of groundwater concentrations at the GSI that were several hundred feet upgradient of the GSI.

Some of the wells that were used are actually upgradient of the lagoons. For our calculations of GSI we restricted the choice of wells to those that are directly along the drain.

Constituent Loading Into the Mixing Zone, page 5, second full paragraph

(8) The consultant's calculations of contaminant flux into the county drain are based upon different assumptions than we used. For instance, the consultant's calculation of groundwater flux into the drain was based only upon contamination entering into the drain from the lagoon areas. However, for the purposes of evaluating the applicability of a mixing zone at this site the entire contaminant plume from all sources was used for the calculation. The "plumes" from various sources are commingled. It is this entire plume that is impacting the surface water. For the purposes of a mixing zone calculation, it is inappropriate to piecemeal the plume, and only evaluate the impact of small portions of the plume in isolation from the impacts of the overall plume.

Secondly, the consultant's calculation of groundwater discharge rate uses an excessively low gradient. The consultant used the gradient between MW24 and MW25. However, we used a mean of three groundwater gradients near the drain itself. Additionally, from a review of the groundwater flow map (figure 3-7 from the RI) it is apparent that the groundwater gradient dramatically increases near the drain. The further to the south that the gradient is measured the less accurate is the gradient for the purposes of evaluating the groundwater discharge rate into the drain. This is due to several factors including the influence of pumping from municipal wells, possible groundwater divide to the south, changes in hydraulic conductivities, etc.

There is an obvious increase in gradient near the county drain all along the width of the plume. For our calculations we averaged the gradients in the areas near the western lagoon, MW25 and the eastern lagoon, starting from the point where the gradient begins to steepen as groundwater approaches the drain. This method of calculation yielded almost an order of magnitude difference in hydraulic gradient and accounts for most of the difference in the calculated groundwater flow into the drain for the entire width of the plume.

There are several other minor differences in how the groundwater flow rate was calculated between MDEQ's calculations, but their impact on the calculations are also very minor. It should be noted however that the western edge of the plume has not been defined. If the plume is significantly wider than 3300 ft, it could effect the groundwater discharge rate significantly.

Finally, hydraulic conductivity values were taken from slug tests. Slug tests generally underestimate hydraulic conductivities by up to an order of magnitude. Thus, it is possible that even our calculations of groundwater flow rates are significantly lower than the actual discharge rates.

Predicted Concentrations Within and at the Boundary of the Mixing Zone

(9) If possible, the calculation of the level of contaminant concentration at the boundary of the mixing zone should be done based upon the forth coming guidance document from MDEQ. If this is not possible, then guidance from upper management may be necessary.

Additionally, Surface Water Division will make the determination on what contaminant loading levels are appropriate for the county drain and Swan Creek.

Table 1, a

(10) MW15S, MW15D, MW16S, and MW16D are upgradient of the lagoons and therefor may negatively bias contaminant loading calculations. MW12S and MW12D are on the north side of

the county drain and more likely reflect groundwater quality from north of the drain and not from the impacted aquifer to the south of the drain.

Table 2, a

MW1, MW2, MW3, MW9S, MW26 and MW27 are all upgradient of the lagoons. Their inclusion in the calculations for groundwater contamination entering the drain likely negatively bias contaminant level calculations for the groundwater/surface water interface.

Attachment A

See above comments for *Constituent Loading Into the Mixing Zone, page 5, second full paragraph.*

General

Overall the consultant presented several technically helpful ideas that should be considered. There are some technical disagreements that will likely need to be addressed as well.

cc: Jim Heinzman, ERD